IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Greinwald et al.
Appl. No.	:	10/786,518
Filed	:	February 24, 2004
For	:	MICROARRAY-BASED DIAGNOSIS OF PEDIATRIC HEARING IMPAIRMENT-CONSTRUCTION OF A DEAFNESS GENE CHIP
Examiner	:	Dan Sung C Cho
Group Art Unit	:	1634
Confirmation No.	:	2735

DECLARATION OF JOHN H. GREINWALD, JR., M.D., FAAP UNDER 37 C.F.R. § 1.132

Assistant Commissioner for Patents
P.O. Box 2327
Arlington, VA 22202

Dear Sir:

I, John H. Greinwald, Jr., M.D., FAAP, do declare the following:

1. I am a co-inventor on the above-captioned patent application.

2. I am an Associate Professor of Otolaryngology and Pediatrics at the University of Cincinnati College of Medicine, Division of Otolaryngology Head and Neck Surgery, Center for Hearing and Deafness Research, Cincinnati Children's Hospital Medical Center located at 3333 Burnet Ave, Cincinnati, OH 45229.

3. I received a B.S. in chemistry from Wofford College, and a Doctor of Medicine from the Medical University of South Carolina. From 1987 to 1988, I was a surgical intern at the Naval Hospital located in Portsmouth, VA. From 1991 to 1995, I was an otolaryngology resident at the Naval Medical Center, Portsmouth, VA. My curriculum vitae are attached hereto as Exhibit A.

4. I have performed extensive research in the field of otology in general, and molecular genetics of deafness in particular, and joined the Children's Hospital Medical Center at the University of Cincinnati in 2000. Prior to joining the Cincinnati Children's Hospital Medical Center, I was a clinical instructor at the Uniformed Services University of the Health Sciences. I have authored or co-authored multiple scientific publications regarding the same. I have also been an invited speaker at numerous conferences and seminars in the area of otolaryngology. I have received both federal and private funding in the form of grants for my research in molecular genetics of deafness and otology and sinus disease.

5. As a co-inventor, I am familiar with the claimed invention of the above-identified patent application. I understand that in the Office Action mailed June 7, 2007, the Examiner made rejections relying on the following references: Williamson *et al.* (Williamson, R., Curator, Deafness Gene Mutation Database, URL: http://hearing.harvard.edu/db/genelist.htm, last updated September 18, 2002) in view of Guo *et al.* (Guo *et al.* 2002. *Genome Res.* 12:447-457). I have reviewed those references and the Final Office Action in preparing this Declaration.

6. As one who has performed and supervised scientific research within the fields of molecular genetics of deafness and otology and sinus disease for several years, I am intimately familiar with the molecular mechanisms involved in hearing loss. In particular, I have published extensively on the role of gene mutations in hearing loss. Accordingly, I am also familiar with the state of the art regarding techniques and methods for studying the role of gene mutations in hearing loss, and the diagnosis of hearing loss associated with particular genes.

7. The current medical evaluation of hearing loss involves a combination of laboratory and radiographic tests, few of which provide diagnostic or prognostic information. These tests are costly, time-consuming, and stressful for the child and family. Most recently, genetic testing of the GJB2 gene has been added to the diagnostic evaluation. Mutations in this gene account for about 20% of children with SNHL with nonsyndromic congenital hearing loss. However, beyond the GJB2, it was uncertain what genetic mutations are

next most prevalent in patients with hearing loss. An array comprising genetic sequences from CDH23, MYO7A, OTOF, SLC26A4 and USH2A, for example, addresses a need for a tool for the accurate, simple, efficient and highly cost-efficient diagnosis of hearing loss which may or may not be unrelated to mutation in the GJB2 gene.

8. It is my opinion that an array comprising genetic sequences from genes CDH23, MYO7A, OTOF, SLC26A4 and USH2A as recited in the claims provides an unexpected benefit because these specific five genes would provide a more comprehensive diagnostic evaluation based on the prevalence of mutations in population and family studies, and the impact of the gene toward communication (*see*, Table 1). That is, OTOF, PDS, MYO7A, CDH23 and USH2A are unexpectedly better than other genes for diagnosing hearing loss. Therefore, an array comprising genetic sequences from CDH23, MYO7A, OTOF, SLC26A4 and USH2A has an unexpected advantage over an array comprising any five randomly chosen known hearing loss genes.

9. In addition, examination of the thirteen genes shown in Table 1 in pediatric patients with sensorineural hearing loss (SNHL) unexpectedly revealed that pathogenic biallelic mutations were only found in MYO7A, OTOF, PDS (also known as SLC26A4) and CDH23 (Figure 1). This data supports the finding that these genes are the key components in SNHL in children after the GJB2 gene.

10. Prior to the filing date of the present application, I was aware of no teaching or suggesting in the literature that MYO7A, OTOF, SLC26A4 and CDH23 are key components in SNHL.

11. The list of hearing loss mutations in Williamson *et al.* provides no prioritization to the importance or prevalence of these mutations or genes in a population. I believe one of ordinary skill in the art would not know, based on the generic list of over fifty genes provided in Williamson *et al.*, to pick the five specific genetic sequences as claimed.

12. Guo is silent as to any hearing loss gene, mutation or SNP.

13. In summary, prior to completing the work that serves as the basis for the present invention, there was no teaching in the literature that would suggest preparing an array comprising genetic sequences from the CDH23, MYO7A, OTOF, SLC26A4 and USH2A genes. Furthermore, there was no reason to expect that such an array would provide a more accurate and cost-effective diagnosis of hearing loss, as it had not been previously demonstrated that MYO7A, OTOF, SLC26A4 and CDH23 are key components in SNHL in children.

14. It is my opinion that the innovations described and claimed in the present application are not obvious in view of either Williamson *et al.* or Guo, when viewed alone or in combination, and their teachings and suggestions.

15. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: 6 Dec 07 By: _____
John H. Greinwald, Jr., M.D., FAAP

Table 1. Genes selected for VDA hydridization.

Gene	Locus	Length	Exons	Mutations	DFNB	DFNA	Other
GJB2	DFNB1/A3	681	2	284	1000+	100+	0
OTOF	DFNB9	7051	48	24	20	0	0
GJB6	DFNB1	783	1	10	31	1	12*
PDS (SLC26A4)	DFNB4/PDS	2342	20	137	116**	0	116
KCNE1	JLNS2	390	1	13	0	0	5
PRES	DFNB61	2057	18	1	2	0	0
TMPRSS3	DFNB8/10	1313	12	9	9	0	0
TMIE	DFNB6	468	4	7	5	0	0
MYO6	DFNB37/A22	3857	35	5	3	1	0
MYO7A	DFNB2/A11/USH1B	6647	49	137	4	1	100+
USH1C	DFNB18/USH1C	2730	28	9	9	0	18
CDH23	DFNB12/USH1D	10065	47	58	20	0	36
NSHL	7 Genes						
Usher and NSHL	3 Genes						
Other syndromic	3 Genes						

(DFNB-autosomal recessive nonsyndromic; DFNB-autosomal dominant nonsyndromic; Other-syndromic or digenic (*); **indeterminate for nonsyndromic vs syndromic alleles.

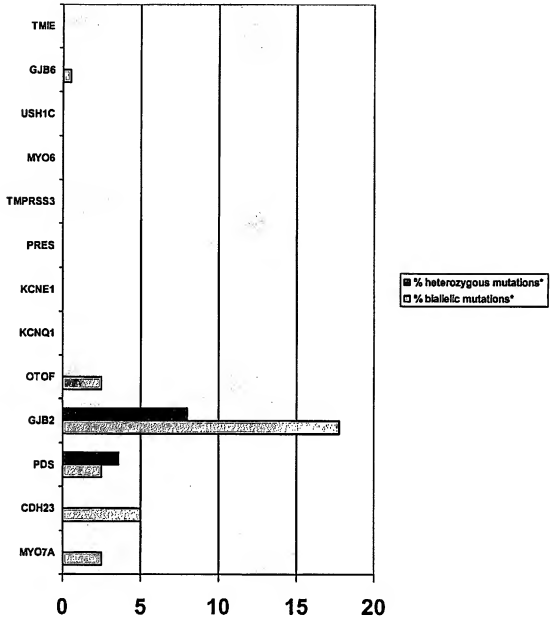

Figure 1. Prevalence of mutations in the genes selected for the deafness VDA. *-denotes % of patients with hearing loss with mutations in the gene.

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EXHIBIT A

CURRICULUM VITAE OF JOHN H. GREINWALD, JR., M.D., FAAP

Personal Data

Name: John H. Greinwald, Jr., M.D., FAAP
Associate Professor of Otolaryngology and Pediatrics,
University of Cincinnati College of Medicine

Address: Division of Otolaryngology Head and Neck Surgery
Center for Hearing and Deafness Research
Cincinnati Children's Hospital Medical Center
3333 Burnet Ave.
Cincinnati, OH 45229

Citizenship: U.S.

II. **Undergraduate Education**

Year	Degree	Institution
1979-1983	B.S. (Chemistry)	Wofford College

III. **Post-Graduate Education**

Year	Position	Institution
1983-1987	Doctor of Medicine	Medical Univ of South Carolina
1987-1988	Surgical Intern	Naval Hospital, Portsmouth
1988-1989	Student, Flight Surgeon	Naval Aeromedical Institute
1991-1995	Otolaryngology Resident	Naval Medical Center, Portsmouth
1996-1998	Pediatric Otolaryngology Fellow	University of Iowa

IV. **Academic Appointments**

Year	Position	Institution
1995-96	Staff Otolaryngologist (Pediatric Otolaryngology)	Naval Medical Center, Portsmouth
1998-2000	Staff Otolaryngologist (Pediatric Otolaryngology)	Naval Medical Center, Portsmouth
1995-2000	Assistant Clinical Professor	Eastern Virginia Medical School

1996-present	Clinical Instructor	Uniformed Services University of the Health Sciences
2000-2004	Assistant Professor	Children's Hospital Medical Center/ University of Cincinnati
2004-present	Associate Professor	Children's Hospital Medical Center/ University of Cincinnati

V. **Other Employment Pertaining to Current Professional Appointments**

1989-1991-U. S. Naval Flight Surgeon

VI. **Certification and Licensure**

Certification Board(s)	Date	Number
Board Certification		
American Board of Otolaryngology	26Mar96	5062
License: Virginia	01Jul88	0101 043154
License: Iowa	14Mar96	31087
License: Ohio	21May00	77959

VII. **Professional Affiliations**

American Academy of Otolaryngology - Head and Neck Surgery
American Society of Pediatric Otolaryngology
Association for Research in Otolaryngology
American Society of Human Genetics
American Academy of Pediatrics
Society for Ear, Nose, & Throat Advances In Children

VIII. **Areas of Interest**

Research- Molecular genetics of deafness,
Clinical- Otology and sinus disease

IX. **Current and Past Funded Projects**

Title	Funded	Grant Period/Agency
A comparison in the efficacy of uvulopalato-plasty by eletrocautery vs carbon dioxide laser	$2,000	N/A
The effect of local epinephrine on cutaneous blood flow in the external ear	$2,500	N/A
The use of anti-oxidants in external ear avulsions	$5,000	N/A

Gastroesophageal reflux and laryngotracheal Reconstruction	$7,000	N/A
Identification and characterization of the DFNB17 gene	$850,000	**NIH KO8 (5/02-4/07)**
(Principal investigator-75%)	$150,000	CHMC Trustees (2/02-1/04)
	$5,000	ASPO (7/01-06/02)
The molecular basis for aminoglycoside ototoxicity (Co-investigator-1% [unfunded)	$1,100,000	**NIH R01 (7/02-6/07)**
(Principal investigator-10%)	$50,000	CHMC TRI (07/05-06/06)
Gene chip for newborn hearing loss	$150,000	CHMC TRI (7/03-6/04)
(Principal investigator-10%)	$778,000	**BRTT (7/04-6/07)**

(**bolded**=active grants)

X. **Teaching Activities**

Naval Medical Center, Portsmouth, 1995-1996, 1998-2000

Eastern Virginia Medical School, 1995-1996, 1998-2000

Uniformed Services University of the Health Sciences, 1995-1996, 1998-2000

University of Iowa Hospitals and Clinics, 1996-1998

Children's Hospital Medical Center, 2000-present

University of Cincinnati College of Medicine, 2000-present

XI. **Teaching Activities Other than Classroom and Clinical - None**

XII. **Other Professional Activities**

Research Coordinator, Dept of Otolaryngology-Head & Neck Surgery, Naval Medical Center, Portsmouth, 1995-1996, 1998-present.
Space Utilization Officer, Dept of Otolaryngology-Head & Neck Surgery, Naval Medical Center, Portsmouth, 1995-1996.
Director, Division of Audiology, Dept of Otolaryngology-Head & Neck

Surgery, Naval Medical Center, Portsmouth 1999-2000

XIII. **Clinical Activities**

Attending Physician, Pediatric Otolaryngology-Head & Neck Surgery, full-time

XIV. **Committees**

Institutional Review Board, Naval Medical Center, Portsmouth 1995-1996, 1998-1999.

American Academy of Otolaryngology, Infectious Disease Committee, 1998-2002.

Physician practice organization, membership committee, 2001-2003.

Department of Otolaryngology, Research Committee, 2000-present; Chair, 2002-present.

AAO-HNSF study section, 2004-present

ASPO Research Committee, 2003-present

XV. **Honors and Awards**

1990	National Defense Medal
1991	Expert Medals in Pistol and Rifle
1991	Letter of Commendation, Commanding General, 2nd Marine Air Wing
1991	Navy Expeditionary Medal
1994	Best Paper Award in Category 3 @ the Annual Naval Medical Center, Portsmouth Research Competition
1994	Best Paper Award at the Annual Meeting of the Virginia Society of Otolaryngology
1994	99% score on the National In-service Exam
1994	Navy Achievement Medal
1995	Best Poster Award (Resident) at the Annual Naval Medical Center Portsmouth Research Competition
1996	Armed Forces Commendation Medal
1996	Resident Travel Award at the Southern Section Meeting of the Triologic Society.
1997	Best Poster Award at the 12th annual meeting of the American Society of Pediatric Otolaryngology (Basic Science)
1999	William P. Potsic 1st Award Basic Science Research Award at the 14th annual meeting of the American Society of Pediatric Otolaryngology
1999	1st place award, category 2, at the Annual Naval Medical Center, Portsmouth Research Competition
2000	Navy Commendation Medal (second award)
2001	Resident Travel Award at the Southern Section Meeting of the Triologic Society (Co-Author).

2005	Charles F. Ferguson Clinical Science 1st and 2nd place Awards at the 20th Annual meeting of the American Society of Pediatric Otolaryngology (Senior Author)
2005	Best Poster Award at the 20th Annual meeting of the American Society of Pediatric Otolaryngology
2005	American Academy of Otolaryngology Head and Neck Surgery Honor Award
2006	William P. Potsic 2nd Award Basic Science Research Award at the 21st annual meeting of the American Society of Pediatric Otolaryngology (Contributing author)
2007	Charles F. Ferguson Clinical Science 3rd place Award at the 22nd Annual meeting of the American Society of Pediatric Otolaryngology (Senior Author)

XVI. **Physical Facilities**

A. Office -100 sq.ft.
B. Laboratory - 1200 sq.ft.

XVII.**Personnel Currently Supervised**

Residents, fellows, students and laboratory personnel Children's Hospital Medical Center

XVIII. **Master's and Ph.D. Theses Directed and Postdoctoral Fellows Supervised –**

1) Monica Giovanni-Master student in Genetic Counseling 2006
2) Brian Strike- Master student in Genetic Counseling 2007

XIX. **Bibliography**

A. Papers published: 57
B. Papers in Press: 1
C. Books/Chapters Published: 6
D. Books/Chapters In Press: 0
E. Abstracts: 9
F. Reviews: 3
G. Presentations: 68
H. Papers Submitted: 3

Papers Published

1. **Greinwald JH**, Wilson JF, Haggerty P. "Peritonsillar abscess: an unlikely cause of necrotizing fasciitis." Annals of Otology, Rhinology, and Laryngology; 104(2):133-137, 1995.

2. **Greinwald JH**, Derkay CS, Schechter GL. "Management of massive neurofibromas in children." American Journal of Otolaryngology; 17(2):136-142, 1996.

3. **Greinwald JH**, Leichtman LG, Simko EJ. "Hereditary thyroglossal duct cysts." Archives of Otolaryngology-Head and Neck Surgery; 122:1094-1096, 1996.

4. **Greinwald JH**, Holtel MR. "Absorption of topical cocaine in rhinologic procedures." Laryngoscope; 106:1223-1225, 1996.

5. **Greinwald JH**, Tomescu E, Lassen LF. "Lipomas of the Internal Auditory Canal." Laryngoscope;107:364-368, 1997.

6. Dunlevy TM, Washington A, **Greinwald JH**. "Congenital cartilaginous rests of the neck." Archives of Otolaryngology-Head and Neck Surgery; 123:655-657, 1997.

7. Gneuchtel MM, **Greinwald JH**, Keyser J, Postma GS. "A comparative study of the efficacy of laser versus cautery assisted uvulopalatoplasty." Laryngoscope;107:848-854, 1997.

8. **Greinwald JH**, Scott DA, Marietta JR, Manaligod J, Ramesh A, Zbar RIS, Kraft ML, Carmi R, Elbedour K, Yosefberg S, Ashley J, Skvorak AB, Srisailapathy CRS, Lovett M, Morton CC, Sheffield VC, Smith RJH. "Construction of a PAC and YAC map encompassing the DFNB7 and DFNB11 region of chromosome 9q13-21." Genome Research;7(9):879- 886,1997.

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10. Hart K, **Greinwald JH**, Shaffrey CI, Postma GS. "Chyle Leak during Anterior Approach to the Cervical Disk: A rare Neurosurgical Complication." Journal of Neurosurgery; 88:151-154, 1998.

11. **Greinwald JH**, Simko EJ. "The diagnosis and management of middle ear osteomas." Ears Nose and Throat Journal; 77(2):134-139, 1998.

12. Chen AH, Mueller RF, Prasad SD, **Greinwald JH**, Manaligod J, Muilenburg AC, Verhoeven K, Van Camp G, Smith RJH. "Presymptomatic diagnosis of non-syndromic hearing loss by genotyping." Archives of Otolaryngology-Head and Neck Surgery; 124:20-24, 1998

13. **Greinwald JH**, Wayne S, Chen AH, Scott DA, Zbar RIS, Kraft ML, Prasad S, Ramesh A, Coucke P, Srisailapathy S, Lovett M, Van Camp G, Smith RJH. "Localization of a

novel gene for non-syndromic hearing loss, DFNB17, to chromosome region 7q31." American Journal of Medical Genetics;78:107-113, 1998.

14. Scott DA, **Greinwald JH**, Marietta J, Drury S, Swiderski RE, Vinas A, DeAngelis MM, Carmi R, Ramesh A, Kraft ML, Elbedour K, Skvorak AB, Friedman RA, Srisailapathy CRS, Verhoeven K, Van Camp G, Lovett M, Deininger PL, Batzer MA, Morton CC, Keats BJ, Smith RJH, Sheffield VC. "Identification and mutation analysis of a cochlear expressed zinc-finger protein gene at the DFNB7/11 and *dn* hearing-loss-loci on human chromosome 9q. and mouse chromosome 19". Gene; 215:461-469, 1998.

15. **Greinwald JH**, Burke DK, Bonthius DJ, Bauman NM, Smith RJH. "An update of the Iowa experience for the treatment of life-threatening hemangiomas with interferon alpha-2a". Archives of Otolaryngology-Head and Neck Surgery; 125:21-27, 1999.

16. Lim AT, Wall MP, **Greinwald JH**. "The effect of dimethylthiourea, melatonin, and hyperbaric oxygen therapy on the survival of reimplanted rabbit auricular composite grafts." Otolaryngology Head and Neck Surgery; 121:231-237, 1999.

17. **Greinwald JH**, Burke D, Sato Y, Poust RI, Kimura K, Bauman NM, Smith RJH. "The treatment of lymphangiomas in children: An update of Picibanil (OK-432) sclerotherapy". Otolaryngology Head and Neck Surgery; 121:381-387, 1999.

18. **Greinwald JH**, Bauman NM. "Larsen's syndrome: Presentation and diagnosis". Otolaryngology Head and Neck Surgery; 121:845 1999.

19. Olney DR, **Greinwald JH**, Smith RJH, Bauman NM. "Laryngomalacia and its treatment". Laryngoscope; 109:1770-1775, 1999.

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23. Carron J, Oberman, J, **Greinwald JH**, Derkay CS. Effects of simulated gastroesophageal reflux on laryngotracheal reconstruction in rabbits. Archives of Otolaryngology 127:576-80, 2001.

24. Gessler E, Hart KE, Dunlevy TD, **Greinwald JH**. The optimal concentration of epinephrine for ear canal injection based on laser doppler flow measurements. Laryngoscope 111:1687-1690, 2001.

25. Holcomb D, Jaffe, D, **Greinwald JH**, Smith RJ, Bauman NM. "The diagnosis and treatment of C1-C2 rotary subluxation". Nontraumatic atlantoaxial rotary subluxation in the pediatric otolaryngology patient. A report of four cases. Annual of Otology, Rhinology and Laryngology; 110:1137-40, 2001.

26. **Greinwald JH**, Hartnick C. The diagnostic evaluation of sensorineural hearing loss in children". Archives of Otolaryngology 128:84-87, 2002.

27. Maddern C, **Greinwald JH**, Hilbert L, Choo DI. Cochlear implantation in children with Auditory Neuropathy. Otology Neurotology 23:163-168, 2002.

28. Scott KJ, Schroeder AA, **Greinwald JH.** Ectopic cervical thymus: an uncommon diagnosis in the evaluation of pediatric neck masses. Archives of Otolaryngology. 128:714-717,2002.

29. Maddern C, Rutter M, Hilbert L, **Greinwald JH**, Choo DI. Clinical and audiological features in auditory neuropathy. Archives of Otolaryngology 128:1026-1032, 2002.

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31. Gessler EM, Simko EJ, **Greinwald JH.** Adult laryngomalacia: An uncommon clinical entity. American Journal of Otolaryngology 23:386-9, 2002.

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45. Schmithorst VJ, Scott K. Holland SK, Ret J, Duggins A, Arjmand E, **Greinwald J.** Cortical Reorganization in Children with Unilateral Sensorineural Hearing Loss. NeuroReport 16(5):463-467, 2005

46. Young W-Y, Zhao L, Qian L, Wang Q, Li, N, **Greinwald JH**, Guan M-X. Extremely low penetrance of hearing loss in four Chinese families

with the mitochondrial 12S rRNA A1555G mutation. Biochemical and Biophysical Research Communications. 328:1244-51, 2005

47. Madden C, Wiley S, Schleiss S, Benton C, Meinzen-Derr J, **Greinwald J**, Choo D. Audiometric, Clinical and Educational Outcomes in a Pediatric Symptomatic Congenital Cytomegalovirus (CMV) Population with Sensorineural Hearing Loss. International Journal of Pediatric Otolaryngology 69:1191-8, 2005

48. Choo D, Ward J, Reece A, Dou H, Lin Z, **Greinwald J**. Molecular mechanisms underlying inner ear patterning defects in kreisler mutants. Developmental Biololgy 289:308-17, 2005

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52. Madden C, Halsted M, Meinzen-Derr J, Bardo D, Boston M, Nishimura C, Yang T, Benton C, Das V, Smith R, Choo D, **Greinwald J**. The influence of mutations in the *SLC26A4/ PDS* gene on the temporal bone in an enlarged vestibular aqueduct population. Archives of Otolaryngology Head and Neck Surgery. 133; 162-168, 2007.

53. Putcha GV, Bejjani BA, Bleoo S, Booker JK, Carey JC, Carson N, Das S, Dempsey MA, Gastier-Foster JM, **Greinwald JH**, Hoffmann ML, Jeng LJ, Kenna MA, Khababa I, Lilley M, Mao R, Muralidharan K, Otani IM, Rehm HL, Schaefer F, Seltzer WK, Spector EB, Springer MA, Weck KE, Wenstrup RJ, Withrow S, Wu BL, Zariwala MA, Schrijver I.Genetics in Medicine. 9:413-26. 2007.

54. Vijayasekaran S, Halsted MJ, Boston M, Meinzen-Derr J, Bardo DM, **Greinwald J**, Benton C.When is the vestibular aqueduct enlarged? A statistical analysis of the normative distribution of vestibular aqueduct size. American Journal of Neuroradiology 28:1133-1138, 2007.

55. Schraff SA, Brown DK, Schleiss MR, Meinzen-Derr J, **Greinwald JH**, Choo DI. The Role of CMV Inflammatory Genes in Hearing Loss. Otolology Neurotology; 137:612-618, 2007

56. Boston M, Halsted M, Meinzen-Derr J, Bean J, Vijayasekaran S, Arjmand E, Choo D, Benton C, **Greinwald J**. The large vestibular aqueduct: a new definition based on audiologic and computed tomography correlation. Otolaryngology Head and Neck Surgery. 136:972-977, 2007.

57. Chen J, Yang L, Yang A, Zhu Yi, Zhao J, Sun D, Tao Z, Tang X, Wang J, Wang X, Tsushima A, Lan J, Li W, Wu F, Yuan Q, Ji J, Feng J, Wu C, Liao Z, Li Z, **Greinwald** J, Lu J, Guan Maternally inherited aminoglycoside-induced and nonsyndromic hearing loss is associated with the 12S rRNA C1494T mutation in three Han Chinese pedigrees. Gene 401:4-11, 2007

Papers in Press

Hemanacah S, Cohen A, **Greinwald J,**Azizkhan R. Massive lymphangiomas in children. Journal of Otolaryngology.

Books/Chapters Published

Greinwald JH, Smith RJH. "Hereditary Hearing Impairment" In Current Therapies in Otolaryngology. Gates GA (ed) 6th ed. Mosby, St. Louis 1998. pp34-41.

Greinwald JH, Smith RJH. Laryngeal disorders. In Principles and Practice of Pediatrics. Oski FA, DeAngelis CD, Feigin RD, McMillan JA, Warshaw JB (eds). J.B.Lippencott Co, Philadelphia, 1999 pp. 1230-1240.

Greinwald JH, Smith RJH. Langerhans' cell histiocytosis. In Tumors of the Ear and Temporal Bone. Jackler RK, Driscoll C (eds). Lippencott-Raven Co, Philadelphia, 2000 pp 417-430

Greinwald JH, Kelly K, Tami T. Temporal bone and skull base trauma. In Neurotology. Jackler RK, Brackmann DE (eds). Mosby, St. Louis, 2004 pp 1070-1088.

Greinwald JH, Cotton RT. Pathophysiology of stridor and airway disease. In Basic Science Review for Otolaryngology. Van De Water TR, Staecker H (eds). Thieme, New York, 2006.

Johnson R, **Greinwald JH**. The genetics of hearing loss. In Otolaryngology Head and Neck Surgery. Bailey B. (ed), 2006.

Abstracts

Greinwald JH. "Absorption of Topical Cocaine in Rhinologic Procedures." Audio Digest Vol.29(9), May 1996.

Towards an understanding of the DFNB17 gene. The proceedings of the 25th annual Midwinter Research meeting of the Association for Research in Otolaryngology, Feb 2002.

Mutations in the connexin 26 gene among Bangladeshi and Americans with nonsyndromic hearing loss. The proceedings of the 25th annual Midwinter Research meeting of the Association for Research in Otolaryngology, Feb 2002.

Mutations in the GJB2 gene among Bangladeshi with nonsyndromic hearing impairment. The proceedings of the 52nd annual meeting of the American Society of Human Genetics, Oct 2002.

Redefining the DFNB17 Interval in Consanguineous Indian Families. The proceedings of the 26th annual midwinter Research meeting of the Association for Research in Otolaryngology, February 2003.

Identification of the DFNB17 gene. The proceedings of the 27th annual midwinter Research meeting of the Association for Research in Otolaryngology. February 2004.

"Maternally inherited aminoglycoside-induced and non-syndromic deafness associated with the novel C1494T mutation in the mitochondrial 12S rRNA gene in a large Chinese family. The proceedings of the 27th annual midwinter Research meeting of the Association for Research in Otolaryngology. February 2004.

Is the GJB2 mutation, V27I/E114G, related to hearing loss? The proceedings of the 28th annual midwinter Research meeting of the Association for Research in Otolaryngology. February 2005.

The role of Fam3c in the development of murine semicircular canals. The proceedings of the 28th annual midwinter Research meeting of the Association for Research in Otolaryngology. February 2005.

Invited Reviews

Greinwald JH, Lassen LF. "Lipomas of the Internal Auditory Canal" in Neoplastic and Inflammatory Diseases of the Head and Neck, section 7 Home Study Course. American Academy of Otolaryngology-Head and Neck Surgery Foundation, Inc. 7: 98-99, 1999.

Greinwald JH, Taggart RT. "Environmental induced hearing impairment: the impact of genetics" in Current Opinions in Otolaryngology & Head and Neck Surgery 10:346-349, 2002.

Greinwald JH, Lim LH. "The evaluation of children with sensorineural hearing loss" in Current Opinions in Otolaryngology & Head and Neck Surgery 10:435-439, 2002.

Presentations

"Peritonsillar Abscess: An Unlikely Cause of Necrotizing Fasciitis". Presented at the Virginia Society of Otolaryngology-Head and Neck Surgery annual meeting in March 1993.

"Management of Massive Neurofibromas in Children." Presented at the Virginia Society of Otolaryngology-Head and Neck Surgery annual meeting in April 1994 and the Association of Pediatric Otolaryngologists portion of the Combined Otolaryngology Spring Meetings in May 1994. Presented at the Naval Medical Center Research competition April 1994.

"The Diagnosis and Management of Middle Ear Osteomas". Presented at the 4th International Symposium on Inner Ear Medicine and Surgery in July 1994.

"The Guinea Pig Model in Middle Ear Barotrauma". Poster presentation at the scientific session of the annual meeting of the American Academy of Otolaryngology-Head and Neck Surgery in September 1995.

"Unusual Internal Auditory Canal Neoplasms: Diagnosis and Treatment". Presented at the annual meeting of the Virginia Society of Otolaryngology-Head and Neck Surgery May 1995 and at the Naval Medical Center Portsmouth research competition, April 1995.

"Temporal Bone Fractures." Presented at the Naval Medical Center Portsmouth Trauma Symposium in November 1995.

"The Absorption of Topical Cocaine in Rhinologic Procedures." Presented at the Southern section of the Triologic Society in January 1996, at the Naval Medical Center research competition, March 1996 and in the Audio-Digest, May 1996.

"Hereditary Thyroglossal Duct Cysts". Presented at the annual meeting of the American Society of Pediatric Otolaryngology, May 1996 and at the 36th annual Short Course in Mammalian Genetics, July 1996.

"A refined physical map of the DFNB7 locus". Presented at the annual meeting of the American Society of Human Genetics, November 1996.

"Construction of a PAC and YAC contig encompassing the DFNB7 and 11 region of chromosome 9q13-22". Presented at the annual meeting of the American Society of Pediatric Otolaryngology, May 1997.

"Non-syndromic hearing loss genes map to the Pendred region of chromosome 7q31". Presented at the annual meeting of the American Society of Pediatric Otolaryngology, May 1997.

"Clinical laboratory for the carbon dioxide laser"-Course instructor. 5th annual Head and Neck Laser Course, University of Iowa College of Medicine, June 1997.

"The effect of dimethylthiourea, melatonin and hyperbaric oxygen therapy on the survival of reimplanted rabbit auriuclar composite grafts". Presented at the annual meeting of the Academy of Otolaryngology-Head and Neck Surgery, September, 1997.

"Identification and mutation analysis of two cochlear expressed genes at the DFNB7/11 locus on chromosome 9q." Presented at the annual meeting of the American Society of Human Genetics, October, 1997.

"The treatment of lymphangiomas in children : An update of Picibanil (OK-432) sclerotherapy". Presented at the annual meeting of the American Society of Pediatric Otolaryngology, May, 1998.

"An update of the Iowa experience for the treatment of life-threatening hemangiomas with interferon alpha-2a". Presented at the annual meeting of the American Society of Pediatric Otolaryngology, May, 1998.

Lecturer and clinical instructor in "Laser applications in bronchology and esphogology" at the 6th annual Head and Neck Laser Course, University of Iowa College of Medicine, June 1997.

Lecturer in "Considerations in laryngotracheal reconstruction" at the 35th annual Head and Neck and Reconstructive Surgery Course, University of Iowa College of Medicine, June 1997.

"The treatment of hemangiomas, lymphangiomas and venous malformations". Instructional course presented at the annual meeting of the American Academy of Otolaryngology-Head and Neck Surgery, September, 1998-2001.

Instructor in "Endoscopic foreign body retrieval laboratory" at The Central Atlantic Brochoesophagolgy Symposium, Medical College of Virginia, October, 1998.

"Update in ENT" at the annual meeting of the military section of the American Academy of Pediatrics, March 1999.

"A tale of two tumors: hemangiomas and lymphangiomas" at the 24th annual MajGen Paul H. Streit Memorial Otolaryngology Seminar, Uniformed Services University of the Health Science, March 1999.

"Cochlear expressed genes in the DFNB7/11 region of chromosome 9q." The annual meeting of the Society of Pediatric Otolaryngology, Palm Desert , CA, April 1999.

Lecturer at The Central Atlantic Brochoesophagolgy Symposium, Medical College of Virginia, October, 1999.

"An update on the use of Picibanil in the treatment of lymphangiomas" Vascular anomalies 2000, New York, NY, April 2000.

"Pediatric Sinusitis" University of Cincinnati Department of Otolaryngology Primary Care Symposium, Cincinnati, OH, November, 2000

"Ectopic thymus: An uncommon cause of cervical masses". The annual meeting of the Society of Pediatric Otolaryngology, Scottsdale, Az, May 2001.

"The audiological and clinical characteristics of auditory neuropathy". The annual meeting of the Society of Pediatric Otolaryngology, Scottsdale, Az, May 2001.

"Cochlear implantation in children with auditory neuropathy". The annual meeting of the American Otologic Society, Palm Springs, AZ, May 2001

"Towards an understanding of the DFNB17 gene". The 25th annual Midwinter Research meeting of the Association for Research in Otolaryngology, St. Petersburg, FL, Feb 2002.

"Mutations in the connexin 26 gene among Bangladeshi and Americans with nonsyndromic hearing loss." The 25th annual Midwinter Research meeting of the Association for Research in Otolaryngology, St. Petersburg, FL, Feb 2002.

"Molecular Biology"" University Hospital Grand Rounds, Cincinnati, Ohio. April 2002.

"Heterogeniety of GJB2 mutations in the Midwestern US." The annual meeting of the American Society of Pediatric Otolaryngology, Boca Raton, FL, May 2002.

"Rehabilitation in Auditory Neuropathy." The annual meeting of the American Society of Pediatric Otolaryngology, Boca Raton, FL, May 2002.

Enlarged Vestibular Aqueduct Syndrome in a pediatric population. The annual meeting of the American Society of Otology, Boca Raton, FL, May 2002.

"Temporal Bone Trauma" University Hospital Grand Rounds, Cincinnati, Ohio, August 2002.

"Current trends in the evaluation of children with sensorineural hearing loss." The 2nd Regional Infant Hearing Symposium, Cincinnati, OH, Sep 2002.

"Currrent trends in the treatment of lymphangiomas." Annual meeting of the American College of Surgeons, San Francisco, CA, Oct 2002.

"Mutations in the GJB2 gene among Bangladeshi with nonsyndromic hearing impairment." The 52nd annual meeting of the American Society of Human Genetics, Baltimore, MD, Oct 2002.

"Enlarged Vestibular Aqueduct Syndrome," University Hospital Grand Roungs, Cincinnati, Ohio November 2002.

"Redefining the DFNB17 Interval in Consanguineous Indian Families", Association for Research in Otolaryngology, Daytona Beach, Florida, February 2003.

"New Horizons in Pediatric Hearing Loss" AAO-HNSF Annual Meeting in Orlando, Florida, September 2003

"Novel Diagnositic and Therapeutic Methods in Pediatric Hearing Loss," Cincinnati Children's Hospital Pediatric grand rounds, Cincinnati, Ohio September 2003.

"Auditory Neuropathy" Cincinnati Children's Hospital Grand Rounds, Cincinnati, Ohio, December 2003.

"Identification of the DFNB17 gene," Association for Research in Otolaryngology, Daytona Beach, Florida. February 2004.

"Maternally inherited aminoglycoside-induced and non-syndromic deafness associated with the novel C1-494-T mutatin in the mitochondrial 12S rRNA gene in a large Chinese family'" Association for Research in Otolaryngology, Daytona Beach, Florida. February 2004.

"The Treatment of Lymphangiomas in Children," B. C. Children's Hospital as invited speaker. Vancouver, Canada April 2004.

"The Biology of Cholesteotomas," B. C. Children's Hospital as invited speaker. Vancouver, Canada April 2004.

"What is new in the diagnosis of sensorineural hearing loss (SNHL)," B. C. Children's Hospital as invited speaker. Vancouver, Canada April 2004.

"Clinical relevance of head and neck anatomy and embryology" University of Cincinnati, Cincinnnati, Ohio. April 2004.

"Audiometric, Clinical and Educational Findings in a Pediatric Symptomatic Congenital Cytomegalovirs." Combined Otolaryngology Spring Meeting, Phoenix, Arizona, May 2004.

"Identification of the DFNB17 Gene" Combined Otolaryngology Spring Meeting, Phoenix, Arizona, May 2004.

"Sensorineural hearing loss in children." Mississippi Society of Otolaryngology, Jackson, Mississippi, September 2004

"Auditory neuropathy in children." Mississippi Conference of Audiologist and Speech and Language Pathologists, Jackson, Mississippi, September 2004.

"New Horizons in Pediatric Hearing Loss" Instructional course at the AAO-HNSF Annual Meeting in Orlando, Florida, September 2004.

Fam3c and its role in the developing inner ear in mice." Association for Research in Otolaryngology, New Orleans, Louisiana, February, 2005.

Is the *GJB2* V27I/E114G genotype related to hearing loss? Association for Research in Otolaryngology, New Orleans, Louisiana, February, 2005.

The influence of mutations in the *SLC26A4/ PDS* gene on the temporal bone in an enlarged vestibular aqueduct population. 20th Annual meeting of the American Society of Pediatric Otolaryngology, Phoenix, Arizona, May 2005.

Assessing the vestibular aqueduct and modiolus in pediatric sensorineural hearing loss: Audiologic and CT correlation. 20th Annual meeting of the American Society of Pediatric Otolaryngology, Phoenix, Arizona, May 2005.

Construction of a deafness related resequencing microarray. 20th Annual meeting of the American Society of Pediatric Otolaryngology, Phoenix, Arizona, May 2005.

The evaluation of children with sensorineural hearing loss. Instructional course at the AAO-HNSF Annual Meeting in Los Angeles, California, September 2005.

Enlarged vestibular aqueduct syndrome and the genetics of hearing loss as an invited visiting professor at the Florida Early Intervention Hearing and Deafness Symposium, St. Augustine, Florida, September, 2005

The evaluation of children with sensorineural hearing loss: A changing paradigm. Invited visiting professor at the Dupont Children's Hospital symposium on cochlear implants and genetics, December, 2005.

CMV induced hearing loss. 21st Annual meeting of the American Society of Pediatric Otolaryngology, Chicago, Il, May 2006.

The evaluation of children with sensorineural hearing loss. Instructional course at the AAO-HNSF Annual Meeting, September 2006.

BMP expression in the inner ear. Association for Research in Otolaryngology, February, 2007.

V27I/E114G genotype: Does it contribute to hearing loss? Association for Research in Otolaryngology, February, 2007.

Enlarged vestibular aqueduct syndrome 22nd Annual meeting of the American Society of Pediatric Otolaryngology, San Diego, California, April 2007.

Genotype-phenotype correlations in GJB2 deafness. 22nd Annual meeting of the American Society of Pediatric Otolaryngology, San Diego, California, April 2007.

Papers Submitted

deAlarcon et al. Unilateral EVA

Lee et al. GJB2 deafness

Lee et al. Novel GJB2 mutations in Asians and the effect of the V27I/E114G genotype

Papers in Preparation

White et al. Incomplete partitioning and modiolar hypoplasia, are they related?

Pilipenko et al. Developmental studies of BMP4 in the inner ear

Unpublished data

Gneuchtel MM, Greinwald JH. "Thyroplasty implant causing a difficult intubation: a case report."

Greinwald JH, Lassen LF. "Atypical acoustic neuroma: a new histopathologicentity."

Hart K, Thomas D, Greinwald JH. Bronchocentric granuloma: an uncommon cause for airway obstruction.